

WHAT IS CLAIMED IS:

1. A process for the adsorption of gases comprising adsorbing the gases in an open, closed, or partially closed system or space with a monodisperse aminomethylated bead polymer based on at least one monovinylaromatic compound and at least one polyvinylaromatic compound and having a porosity of from 40 to 70%, wherein the bead polymers are prepared by a process comprising
  - (a) reacting monomer droplets made from at least one monovinylaromatic compound and at least one polyvinylaromatic compound, and, if desired, a porogen and/or, if desired, an initiator or an initiator combination to give a monodisperse, crosslinked bead polymer,
  - (b) amidomethylating the monodisperse, crosslinked bead polymer using phthalimide derivatives, and
  - (c) converting the amidomethylated bead polymer to an aminomethylated bead polymer.
2. A process according to Claim 1 wherein the degree of crosslinking of the monodisperse aminomethylated bead polymer is from 2 to 90%.
3. A process according to Claim 1 wherein the average pore diameter of the monodisperse aminomethylated bead polymer is from 100 to 900 Angstrom.
4. A process according to Claim 1 wherein the concentration of the functional groups of the monodisperse aminomethylated bead polymer is from 0.2 to 3.0 mol/l.
5. A process according to Claim 1 wherein the monodisperse aminomethylated bead polymer is used in the form of a bed.
6. A process according to Claim 5 wherein the gases are acidic gases or organic gases or vapors.

7. A process according to Claim 6 wherein the acidic gases are CO, CO<sub>2</sub>, NO, NO<sub>2</sub>, N<sub>2</sub>O, N<sub>2</sub>O<sub>5</sub>, SO<sub>2</sub>, SO<sub>3</sub>, HCl, HBr, H<sub>2</sub>S, HCN, dicyan, or phosgene.

5 8. A process according to Claim 5 wherein the open, closed, or partially closed system or space is a survival system for spacecraft, vehicles, buildings, plants, aircraft, mines, or chemical factories; a respiratory device; a survival system in the medical sector; or diving equipment.

10 9. A process according to Claim 5 wherein the open, closed, or partially closed system or space is a respiratory protection mask, protective clothing, or a survival system.

15 10. A respiratory protection mask, protective clothing, or a survival system provided with a monodisperse aminomethylated bead polymer in the form of a bed according to Claim 5 in an amount sufficient to remove acidic gases or organic gases or vapors over prolonged periods by adsorption.

11. A process for regenerating monodisperse aminomethylated bead polymers that have been saturation with acidic gases or with organic gases or vapors comprising

- 20 (1) applying steam under atmospheric conditions, or  
(2) applying subatmospheric pressure, with or without additional application of heat and/or of hot gases, or  
(3) applying heated or unheated CO<sub>2</sub>-free air.